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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,714	09/17/2003	Daijiro Inoue	57810-076	2234
7590	08/11/2005		EXAMINER	
McDERMOTT, WILL & EMERY 600 13th Street, N.W. Washington, DC 20005-3096			SEFER, AHMED N	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/663,714

Applicant(s)

INOUE ET AL

Examiner

A. Sefer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-23 is/are pending in the application.
- 4a) Of the above claim(s) 8,10,13 and 17-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6,7,9,11,12,14-16 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. The amendment filed May 19, 2005 has been entered. Claim 5 has been cancelled and no new claims have been introduced.

***Claim Rejections - 35 USC § 112***

2. Claim 12 recites the limitation "the interspaces". There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 6, 7, 11, 12, 14 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanizawa et al. ("Tanizawa") EP 1063711.

Tanizawa discloses (figs. 1-5, 8 and pars. 0369 and 0370) a nitride-based semiconductor light-emitting device comprising: a first conductivity type first nitride-based semiconductor layer 205 formed on a substrate or first conductivity GaN substrate 203 (as in claim 23); an active layer 7/56, formed on said first nitride-based semiconductor layer, consisting of a nitride-based semiconductor layer; an optical guide layer 58 formed on said active layer; a second conductivity type second nitride-based semiconductor layer 59/108 consisting AlGa<sub>N</sub> (par. 0028) (as in claim 3) formed on said active layer; an undoped contact layer 9 (par. 0370) having a band gap smaller than the band gap of said second nitride-based semiconductor layer (as in claim 2)

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formed on said second nitride-based semiconductor layer; and an electrode 10 formed on said undoped contact layer, wherein said undoped contact layer has a thickness within the range recited in the claim (par. 0028).

Regarding claim 4, Tanizawa discloses a first conductivity type first nitride-based semiconductor layer being an n-type first nitride-based semiconductor layer, and said second conductivity type second nitride-based semiconductor layer being a p-type second nitride-based semiconductor layer.

Regarding claims 6 and 7, Tanizawa discloses said undoped contact layer containing InGaN (as in claim 7) having a band gap larger than the band gap of said active layer.

Regarding claim 11, Tanizawa discloses in fig. 4 undoped third nitride based layer 108a formed at least between an active layer 7 and a second conductivity type second nitride-based semiconductor layer 108b, consisting of a nitride-based semiconductor having a smaller band gap than said second nitride-based semiconductor layer.

Regarding claim 12, as understood, Tanizawa discloses undoped third nitride-based semiconductor layer 108a being formed only between said active layer and said second nitride-based semiconductor layer in the interspaces between said active layer and said first and second conductivity type first and second nitride-based semiconductor layers.

Regarding claim 14, Tanizawa discloses said second conductivity type second nitride-based semiconductor layer includes a second conductivity type second nitride-based semiconductor layer consisting of AlGa<sub>N</sub>, and said undoped third nitride-based semiconductor layer includes an undoped third nitride-based semiconductor layer consisting of GaN.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4, 6, 7, 9, 15 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwak et al. ("Kwak") US PG-Pub 2002/0074556 in view of Nagahama et al. ("Nagahama") JP 2000-299497.

Kwak discloses (figs. 9-12 and pars. 0056 and 0060-0062) a nitride-based semiconductor light-emitting device comprising: a first conductivity type first nitride-based semiconductor layer 158 formed on a substrate or first conductivity GaN substrate (as in claim 23); an active layer 160, formed on said first nitride-based semiconductor layer, consisting of a nitride-based semiconductor layer; a second conductivity type second nitride-based semiconductor layer 162a consisting AlGaIn (as in claim 3) formed on said active layer; an undoped contact layer 164 having a band gap smaller than the band gap of said second nitride-based semiconductor layer (as in claim 2) formed on said second nitride-based semiconductor layer; and an electrode 168 formed on said undoped contact layer, but lacks anticipation of an optical guide.

Nagahama discloses in fig. 5 a nitride-based semiconductor light-emitting device comprising an optical guide 8 formed on an active layer 6.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify Kwak's device by incorporating an optical guide since that would prevent generation of fine cracks as taught by Nagahama.

Regarding the thickness of the undoped contact layer, it would have been obvious to meet the recited range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involve only routine skill in the art. In re Aller, 105 USPQ 233. Furthermore, the specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Regarding claim 4, Kwak discloses a first conductivity type first nitride-based semiconductor layer being an n-type first nitride-based semiconductor layer, and said second conductivity type second nitride-based semiconductor layer being a p-type second nitride-based semiconductor layer.

Regarding claims 6 and 7, Kwak discloses said undoped contact layer containing InGaN (as in claim 7) having a band gap larger than the band gap of said active layer.

Regarding claim 9, Kwak discloses undoped contact layer being constituted of a single undoped nitride-based semiconductor layer.

Regarding claim 15, Kwak discloses a second conductivity type second nitride-based semiconductor layer including a second conductivity type cladding layer having a projection 162b, said undoped contact layer being formed on the upper surface of said projecting portion of said second conductivity type cladding layer, and said projecting portion of said second conductivity type cladding layer and said undoped contact layer constitute a ridge portion.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanizawa in view of Nagahama.

Tanizawa discloses the device structure as recited in the claim including an active layer consisting of a nitride-based semiconductor containing In, but lacks anticipation of a protective layer.

Nagahama discloses in fig. 5 a nitride-based semiconductor light-emitting device comprising a protective layer 7 of a nitride-based semiconductor layer formed on said active layer for preventing In contained in said active layer from desorption.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify Nagahama's device by incorporating an a protective layer since that would prevent generation of fine cracks as taught by Nagahama.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (571) 272-1921.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANS  
August 5, 2005

  
**EVAN PERT**  
**PRIMARY EXAMINER**